

Application Serial No.: 10/757,465
Reply to Office Action dated May 20, 2005

IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 3 and 13. These sheets, which include Figs. 3 and 13, replace the original sheets including Figs. 3 and 13.

Attachment: Replacement Sheets

SUPPORT FOR THE AMENDMENT

This Amendment amends Claims 1, 16, and 17. Support for the amendments is found in the specification and claims as originally filed. For example, support for the amendment to Claims 1 and 16 is found in original Claim 13. The amendment to Claim 17 is grammatical in nature. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-17 will be pending in this application. Claims 1 and 12-17 are independent.

Additionally, this Amendment amends Figures 3 and 13. Support for the amendments is found in the specification as originally filed. For example, support for the amendment to Figure 3 can be found on page 22, lines 12-17, of the originally filed specification. Furthermore, support for the amendment to Figure 13 can be found on page 34, lines 19-25, of the originally filed specification. The amendments to Figures 3 and 13 makes the depictions therein correspond to the originally filed written description, and therefore no new matter would be introduced by entry of these amendments.

REQUEST FOR RECONSIDERATION

The Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The Office Action indicates that the incorporation by reference of the Japanese patent application is improper. The Applicants respectfully traverse this assertion. The U.S. Patent and Trademark Office's Manual of Patent Examining Procedure (MPEP) clearly states in section 201.13 II.G. that the incorporation by reference of a foreign priority application is

permitted. The Applicants note that the Official Action does not make an assertion that specific essential information from the Japanese patent application is not set forth in the present specification, but rather a blanket assertion that such an incorporation by reference is not permitted. However, based upon MPEP section 201.13, the Applicants assert that such a blanket statement is not proper. Thus, the Applicants respectfully request that the objection to the incorporation by reference be withdrawn.

Claims 1, 2, 4-7, 11, and 16 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,186,597 ("Brown").

In the Office Action, Brown is indicated as anticipating each of independent Claims 1 and 16. However, the Applicants note that a claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). As will be demonstrated below, Brown clearly does not meet each and every limitation of the independent Claims 1 and 16.

Claim 1 of the present application recites a detecting apparatus comprising, among other features, a plurality of signal generating devices each generating a signal whose magnitude varies periodically in accordance with a positional change of a rotating shaft, whose position is offset when force is applied thereto, a characteristic amount detecting device detecting a characteristic amount corresponding to an amount of positional offset of the rotating shaft from a rotational axis of the rotating shaft, and a moment detecting device detecting a moment applied to the rotating shaft on the basis of the characteristic amount detected by the detecting device, and on the basis of a relationship which is determined in

advance on the basis of a shaft stiffness of the rotating shaft and the characteristic amount which varies in accordance with the positional offset of the rotating shaft. The Applicants submit that Brown does not disclose all of the above limitations of Claim 1.

Brown describes a torque meter that measures the torque of a rotating shaft using at least two sensors. The torque measurement is a measurement of the twisting of the shaft about the rotational axis of the rotating shaft along the length of the shaft. The torque meter of Brown is distinctly different from the apparatus recited in Claim 1 of the present application.

As noted above, Claim 1 recites a detecting apparatus comprising a characteristic amount detecting device detecting a characteristic amount corresponding to an amount of positional offset of the rotating shaft from a rotational axis of the rotating shaft, and a moment detecting device detecting a moment applied to the rotating shaft on the basis of the characteristic amount detected by the detecting device. Thus, a force is applied that provides an amount of positional offset of the rotating shaft from a rotational axis of the shaft, and a moment applied to the shaft is detected based on that positional offset of the rotating shaft from a rotational axis of the shaft. To the contrary, Brown does not contemplate positional offset of a rotating shaft from a rotational axis of the shaft. Brown is concerned with twisting of the shaft about the axis of the shaft. The shaft in Brown is never positionally offset from the rotational axis thereof. Thus, Brown does not teach or even suggest a device that can detect a moment applied to a rotating shaft by detecting positional offset of the rotating shaft from a rotational axis of the shaft, in the manner recited in Claim 1 of the present application.

Furthermore, Brown does not disclose a moment detecting device that detects a

moment “on the basis of a relationship which is determined in advance *on the basis of a shaft stiffness*,” as recited in independent Claim 1 of the present application. No disclosure is present in Brown of a moment detecting device that detects a moment based on shaft stiffness. In fact, Brown never mentions shaft stiffness in the description of the invention. Brown relies upon information from various sensors to measure torque on the rotating shaft.

Accordingly, the Applicants submit that Brown fails to disclose all of the limitations expressly recited in Claim 1, and therefore Brown does not anticipate Claim 1. Thus, the Applicants respectfully request the withdrawal of the anticipation rejection of Claim 1 based on Brown.

Claims 2 and 4-7 are considered allowable for the reasons advanced for Claim 1 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed nor suggested by the applied references when those features are considered within the context of Claim 1.

Claim 16 of the present application recites a detecting apparatus comprising, among other features, a plurality of signal generating devices each generating a signal whose magnitude varies periodically in accordance with a positional change of a rotating shaft, whose position is offset when force is applied thereto, and a moment detecting device detecting a moment applied to the rotating shaft around an imaginary axis that is substantially perpendicular to a rotational axis of the rotating shaft, on the basis of the phase difference detected by the detecting device. The Applicants submit that Brown does not disclose all of the above limitations of Claim 16.

As mentioned above, Brown describes a torque meter that measures the twisting of

the shaft about the rotational axis of the rotating shaft along the length of the shaft. The torque meter of Brown is distinctly different from the apparatus recited in Claim 16 of the present application.

As noted above, Claim 16 recites a detecting apparatus comprising a moment detecting device detecting a moment applied to the rotating shaft around an imaginary axis that is substantially perpendicular to a rotational axis of the rotating shaft. Thus, a force is applied that provides a positional change of a rotating shaft that is positionally offset when force is applied thereto, such that a moment is applied to the rotating shaft around an imaginary axis that is substantially perpendicular to a rotational axis of the rotating shaft. To the contrary, Brown does not contemplate positional offset of a rotating shaft or a moment applied to the shaft around an axis that is substantially perpendicular to a rotational axis of the shaft. Brown is concerned with twisting of the shaft about the axis of the shaft. The shaft in Brown is never contemplated as having a moment applied thereto that is substantially perpendicular to rotational axis of the shaft, but merely a twisting that is along the axis of the shaft. Thus, Brown does not teach or even suggest a detecting apparatus as expressly recited in Claim 16 of the present application.

Accordingly, the Applicants submit that Brown fails to disclose all of the limitations expressly recited in Claim 16, and therefore Brown does not anticipate Claim 16. Thus, the Applicants respectfully request the withdrawal of the anticipation rejection of Claim 16 based on Brown.

Claims 12, 14, 15, and 17 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,550,320 ("Giustino").

In the Office Action, Giustino is indicated as anticipating each of independent Claims 12, 14, 15, and 17. However, the Applicants note that a claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). As will be demonstrated below, Giustino clearly does not meet each and every limitation of the independent Claims 12, 14, 15, and 17.

Giustino describes a system and method for predicting tire forces using tire deformation sensors. As noted in the Field of the Invention section, Giustino relates to the field of tire dynamics and more specifically to predicting the forces generated in the tire contact patch from measurements of tire deformations, including separating the lateral force and the circumferential torque using measurements of tire deformations. Giustino is not concerned with positional change or offset of a rotating shaft upon which the tire is mounted or forces applied to the shaft, but rather Giustino is concerned solely with tire deformation. Giustino does not discuss or concern itself with the shaft upon which the tire is mounted.

Each of Claims 12, 14, 15, and 17 recite signal generating devices each generating a signal whose magnitude varies periodically in accordance with a positional change of a rotating shaft, whose position is offset when force is applied thereto. Such a feature is not disclosed in Giustino. Giustino does not positional offset of a rotating shaft when force is applied thereto. Giustino merely measures tire deformations.

Furthermore, Claim 12 of the present application also recites a characteristic amount detecting device detecting a characteristic amount corresponding to an amount of positional offset of the rotating shaft, and a tire generated force detecting device detecting a tire

generated force on the basis of the characteristic amount detected by the characteristic amount detecting device, and on the basis of a relationship which is determined in advance on the basis of a shaft stiffness of the rotating shaft and the characteristic amount which varies in accordance with the positional change of the rotating shaft. Claim 14 recites a moment detecting device detecting a moment around an imaginary axis which exists within a plane which is perpendicular to the rotating shaft of the tire, on the basis of the difference between the signals generated by the pair of signal generating devices. Claim 15 recites a moment detecting device detecting a moment around an imaginary axis in a horizontal direction of the tire, on the basis of the difference between the signals generated by the pair of signal generating devices. And Claim 17 recites signal generating devices being disposed at predetermined positions such that phases of the generated signals differ when a positional change of the rotating shaft arises, a moment detecting device detecting a moment around an imaginary axis which exists within a plane which is perpendicular to the rotating shaft of the tire, on the basis of the phase difference, and a tire generated force detecting device detecting a tire generated force on the basis of the moment detected by the moment detecting device. Such features are not disclosed in Giustino, as these features relate to a rotating shaft, rather than to tire deformations.

Thus, Giustino does not disclose all of the limitations expressly recited in Claims 12, 14, 15, and 17 of the present application. Accordingly, the Applicants respectfully request the withdrawal of the anticipation rejection of Claim 12, 14, 15, and 17 based on Giustino.

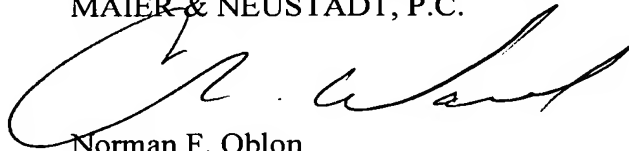
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Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully Submitted,

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